

ABSTRACT

A bi-directional wavelength division multiplexing self-healing optical ring network is disclosed, in which N optical signals are processed at both first and second ring network so that a protection switch mechanism is performed when a link failure occurs in any one of the first and second ring networks. The bi-directional WDM self-healing optical ring network includes a plurality of nodes having optical add/drop multiplexers, each being provided on the first and second ring networks and further including a demultiplexer and a multiplexer, each of which has a capacity of $1 \times N$; a pair of switching devices provided across the first and second ring networks and connected between the optical add/drop multiplexers and fiber optic links connected with another node; and, wavelength interleavers, each being provided on both ends of each optical add/drop multiplexer provided on the first and second ring networks, includes three ports, of which one port is connected to each switching device and allows for passing signals of all wavelength bands, another port allows for passing only signals of some wavelength bands processed on any one of the first and second ring networks, and the third port allows for passing only signals of the other wavelength bands processed on the other.